Development of an open platform for AI-assisted diagnosis in endoscopic examinations

~To offer applications of Computer-Aided Diagnosis (CAD) in Gastrointestinal Endoscopy~

March 13th, 2019
Takaharu Yamada
General Manager
GI&R Endoscopy Marketing Department
Utilize ICT-AI to enhance the efficiency of customers’ work and satisfaction
Endoscopic Inspection Workflow

ICT reduces stress/loads in preparation

Inspection Preparation

ICT improves efficiency & quality in cleaning & disinfection

Endoscope Reprocessing

AI supports insertion through navigation*

Insertion

ICT realizes semi-automated reporting

Reporting

AI assists diagnosis by providing more information*

Diagnosis

ICT supports efficient & effective treatment

Therapy

*Technology not yet approved under the Act on Pharmaceuticals and Medical Devices
Endoscopic Inspection Workflow

- **Inspection Preparation**
  - Reduced Inspection Preparation Requirements utilizing ICT Technology

- **Insertion**
  - Insertion Support Navigation Utilizing AI Technology

- **Diagnosis**
  - High-Quality Cleaning and Disinfection Process Enabled with ICT Technology
  - Self Reporting Enabled with AI and ICT Technology
  - Efficient therapy with ICT technology

- **Advanced Therapy**
  - AI assists diagnosis by providing more information *

*Technology not yet approved under the Act on Pharmaceuticals and Medical Devices
Computers quantitatively analyze medical images and support disease diagnosis (detection and differentiation) by doctors. Doctors make final decisions.

**CAD**
Computer-Aided Diagnosis

**CADx**
Computer-aided diagnosis

**CADe**
Computer-aided detection

*Technology not yet approved under the Act on Pharmaceuticals and Medical Devices*
Which diseases/organs does the technology apply to?

- Cancer
- Tumors
- IBD
- etc...
We will continue working with healthcare professionals while also looking to collaborate with other organizations that offer strong AI technology to complement our own CAD development, aiming to realize a range of CAD applications technologies for the gastrointestinal endoscopy field.

*Technology not yet approved under Act on Pharmaceuticals and Medical Devices
Contribute to enhance the efficiency in endoscopic inspection

Clinical images are not allowed to be attached

*Technology not yet approved under Act on Pharmaceuticals and Medical Devices
CADe: Computer-aided detection

Detecting lesions under various conditions based on training data from expert doctors

- Prominent lesion
- Lesion at edge of image
- Lesion in background

Clinical images are not allowed to be attached

*Technology not yet approved under Act on Pharmaceuticals and Medical Devices*
CADe: Computer-aided detection

Detecting lesions under various conditions based on training data from expert doctors

<table>
<thead>
<tr>
<th>Lesion appears small in image</th>
<th>Dimly lit lesion</th>
<th>Flat lesion</th>
</tr>
</thead>
</table>

Clinical images are not allowed to be attached

*Technology not yet approved under Act on Pharmaceuticals and Medical Devices
Launched EndoBRAIN®, AI-assisted diagnostic support software for endoscopic images, with an expectation as a diagnostic support tool for doctors in colonoscopies. Obtained the Japan’s first regulatory approval as an AI technology in the endoscopy field.
May 7th, 2018
News Release from Olympus America Inc. (OAI)

Executed a co-development agreement with ai4gi, a joint venture between Satis Operations and Imagia, specialized in AI solution for real-time clinical decision support in colonoscopy.
Near future: Multiple CAD devices will be offered by various companies.

Doctors require multiple CAD devices on hand.
CAD Open Platform

Incorporate CAD software from various companies → CAD algorithms developed by our partners are converted to software that runs on our platform

*Technology not yet approved under Act on Pharmaceuticals and Medical Devices
This technology will offer a range of CAD software available on our platform by converting CAD algorithms developed by partner companies to CAD software for use on our platform.

*Technology not yet approved under Act on Pharmaceuticals and Medical Devices
CAD devices, developed by partner companies, may also be provided through our sales channel, independently from the CAD Open Platform, depending on circumstances.”

*Technology not yet approved under Act on Pharmaceuticals and Medical Devices
We will continue striving to develop technologies by utilizing AI and ICT to further advance and spread the Endoscopic Medicine.

*Technology not yet approved under the Act on Pharmaceuticals and Medical Devices